MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2015/2016

TIS3151/ TRQ3211 – SOFTWARE RELIABILITY AND QUALITY ASSURANCE

(All sections / Groups)

13th October 2015
9.00 am to 11.00 am
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 4 pages excluding the cover page with 5 Questions only.

2. Attempt all **FIVE** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please print all your answers in the Answer Booklet provided.

QUESTION 1

a. James is a new programmer in a software development company. He was informed by the chief software engineer that he has made logical design errors that caused software errors. Give THREE examples of logical design errors.

[3 Marks]

b. Answer the question based on the discussion below:

"The new version of loan software is really accurate. We have processed 4000 customer requests, and checked each of the output contracts. There were no errors. Unfortunately, we did face severe unexpected problems – training new staff to use the software takes about two weeks that causes high employee turnover (due to system complexity). In addition, the software could not produce standard output that can be used as input for reporting software."

Identify the missing McCall's quality factors in the discussion above. **Justify your answer.**

[3 Marks]

c. Kristine was asked to develop software that sends automatic email notification that serves as a reminder if an employee is late to work at most two times a week. Consider the pseudo-code that was written by Kristine:

```
IF countLate < 2 THEN

 sendEmail

ELSE
doNothing

ENDIF
```

(i) In your opinion, did the pseudo-code meet the user's requirement? Explain your answer.

[3 Marks]

(ii) Assume that the pseudo-code is implemented using C++. Will the software perform as intended? Explain your answer.

[2 Marks]

(iii) Correct the pseudo-code above based on the user's requirement.

[1 Mark]

....*Continued*

QUESTION 2

a. Alex claims that floating point numbers are error- prone construct and he avoids them in his codes. Do you agree with Alex's point of view? Give an example to support your answer

[2 Marks]

b. Consider the following code.

```
// File Name : Example.java
import java.io.*;
public class Example{

  public static void main(String args[]){
      int a[] = new int[2];
      System.out.println("Access element three :" + a[3]);
  }
}
```

(i) Suggest a method that does continual checking on the code given above to detect exceptions?

[1 Mark]

(ii) Modify the code above based on your suggestion in (i)

[3 Marks]

c. SoftGib Inc. uses reliability metrics to quantitatively express the reliability of a software product. Identify suitable reliability metrics that can be assigned for each of the assessment below. Provide an example of metric requirement for each of your answers.

(i) Number of failures over number of request.

[2 Marks]

(ii) Time between system failures.

[2 Marks]

(iii) Repair or restart after system failure.

[2 Marks]

...Continued

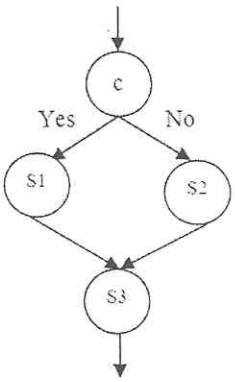
QUESTION 3

a. EliteSoft Sdn. Bhd. uses advanced spiral model as the software development model. In your opinion, what could be the reason for EliteSoft to adopt this model?

[3 Marks]

b. Pseudo- code is vital to produce error- free software. Write if- then- else statement for the flow graph below:

[3 Marks]



c. Why is it of special importance to make a choice of appropriate participants for a formal design review?

[2 Marks]

d. In some cases of formal design review, the project leader is appointed as the review leader.

(i) What is the main justification for this decision?

[1 Mark]

(ii) In most cases, the choice proves to be undesirable professionally. Why? State 3 reasons.

[3 Marks]

QUESTION 4

a. State any THREE important attributes required of an effective software metrics.

[3 Marks]

b. Successful implementation of Verification and Validation (V&V) process involves the commitment of the management. Elaborate the ways in which the management can support the V &V process.

[3 Marks]

...Continued

c. Assume that you work for organization that develops ***database*** products for individuals and small businesses. This organization is interested to quantify its software development. Suggest appropriate **product** and **process metrics** (2 each) that can be used for this process. State reasons for suggesting the above metrics?

[6 Marks]

QUESTION 5

a. Describe the FOUR steps in Deming's Wheel for Total Quality Management (TQM).

[2 Marks]

b. Raj is a programmer developing new software. He began to add and modify number of features as he thought about them during the development process.

(i) Identify the type of risk he was taking?

[1 Mark]

(ii) What is the effect of his actions on the software and process?

[3 Marks]

(iii) Suggest how this risk can be minimized.

[2 Marks]

c. Mohd. Azwan a risk management specialist is called to do risk management for a software house. Outline his complete plan of action to conduct a proper risk management.

[4 Marks]

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